REMARKS/ARGUMENTS

Applicant will respond to the various items in the office action in the order they are presented.

Examiner's Paragraph 1:

Applicant will address the Examiner's comments upon Applicant's prior Response in the context of Applicant's remarks in response to the Examiner's claim rejections below.

Examiner's Paragraph 2:

Drawings

The Examiner has objected to the drawings under 37 C.F.R. § 1.83(a):

"The drawings must show every feature of the invention specified in the claims. Therefore, 'at least one operating sensor, means for receiving sensor signals from a selected operationg function of said turbine engine, a progammable electronic control unit, means for directing said fuel injector control signals to said selected fuel injector groups' in claims 1-14 must be shown or the feature(s) canceled from the claim(s)."

In response to the Examiner's requirement, Applicant has included an additional drawing sheet showing Figures 6A and 6B. These figures show the various elements required by the Examiner. The difference between Figures 6A and 6B is that each shows an alternative grouping of injectors that can be implemented by the electronic control unit. No new matter has been introduced. In view of the added Figures, Applicant respectfully requests that the Examiner withdraw the objection and new drawing requirement.

Examiner's Paragraph 4:

Claim Rejections - 35 U.S.C. § 112

The Examiner has rejected claim 3 "...as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention." In particular the Examiner notes that the phrase "may be" in line 1 renders the claim indefinite. Applicant has amended the claim along the line suggested by the Examiner. Further, Applicant has amended the claim to note that the groupings are determined by the electronic control unit.

Examiner's Paragraph 6:

Claim Rejections - 35 U.S.C. § 102

The Examiner has rejected claims 1 – 14: "...under U.S.C. 102(b) as being anticipated by Ng (US 5,205,116)." Applicant, in his last Response, submitted that the teaching of Ng is not anticipatory of Applicant's invention, but in fact teaches away from Applicant's invention. Applicant repeats and incorporates herein his remarks from the last Response. In view of the Examiner's comments on Applicant's prior remarks, Applicant submits the following additional arguments.

In the Response to Arguments, the Examiner noted that: "the features upon which Applicant relies (i.e. stoppage of flow for both manifolds when load is less that 50%) are not recited in the rejected claim(s)." The stoppage of flow at less than 50% load is but one difference between Applicant's invention and that of either Ng or Iwai. Applicant acknowledges that this feature was not previously claimed, and has amended the claims to add a dependent claim (15) to recite this feature.

Further, in the Response to Arguments, the Examiner noted that: "the features upon which Applicant relies (i.e. modulating the individual injectors to control fuel to the combustion chamber) are not recited in the rejected claim(s)." Applicant respectfully submits that this feature is set forth in claim 1, step d): "...to modify the pulse duration and/or frequency of said fuel injector groups..." As will be discussed below, the method of Ng also does not equate or anticipate Applicant's invention.

Applicant's invention is distinguished from that of Ng and Iwai in two very important respects. First, the teaching of the present application is that fuel injectors, arranged in groups, can be pulsed on and off so that the total fuel delivered by the groups is sufficient to run the engine at the required load. In addition, the patent application teaches that the opening and closing of the injectors in each group can be staggered; that is, there is a phase difference in their on and off cycles. Second, Applicant's invention teaches that the grouping of the injectors can be changed in response to engine conditions. This is clearly shown in Applicant's discussion of Figures 5A and 5B. Figure 6 has also been added to show the different groupings in which injectors can be arranged (for 6 injectors). It should be noted that any one injector can be placed in more than one group (not simultaneously, of course). That is, in Figure 6A, injector 8-1 is part of the group 8-1, 8-3, and 8-5 while in Figure 6B, injector 8-1 is part of the group 8-1 and 8-4. Neither Ng nor Iwai teach pulsed injectors that can be assigned to different groupings.

Ng discloses two manifolds to each of which are attached several injectors. Normally, both the primary and secondary manifolds are supplied with fuel. However, once a stall condition is detected, the fuel supply to one of the manifolds (and its injectors) is cut off. The fuel supply is reestablished to the manifold when the stall condition has passed. While two groups of injectors are recited (those on the first and second manifold), Ng teaches no way to

change the number of injectors that are responsive to the fuel flow on each manifold. In addition, fuel flow to the manifold that is controlled in the event of a stall is an either on or off proposition. There is no pulsing of fuel to the manifold and, by extension, to the injectors connected to the manifold. By design, in normal operation, the manifolds are always supplied with fuel and are, therefore, not pulsed. It should be noted that in Ng's second embodiment, individual valves on each injector in the secondary loop have replaced a single control valve for the loop. However, the individual valves are operated as a unit from control line 40 to accomplish the same effect as in the first embodiment.

For all the above reasons, Applicant respectfully submits that Ng does not anticipate Applicant's invention, and Applicant requests the Examiner to withdraw the 35 U.S.C. 102(b) rejection.

Examiner's Paragraph 7:

Claim Rejections - 35 U.S.C. § 102

The Examiner has rejected claims 1 - 14 "...under U.S.C. 102(b) as being anticipated by Iwai (US 5,339,635)." Applicant repeats and incorporates herein his remarks from the last Response as well as the additional description of the features of Applicant's invention set out above in response to the rejection based on Ng. Again, in view of the Examiner's comments on Applicant's prior remarks, Applicant submits the following additional arguments.

Iwai teaches the use of auxiliary flames generated by auxiliary injectors formed circumferentially around the main engine injectors. Fuel is constantly supplied to the auxiliary injectors and is similar to Ng in this respect. At no time is fuel completely cut off by Iwai. In Iwai's primary embodiment (Figure 1) the individual valves, 50, for each main injector are either

open or closed. There is no pulsing or modulating of the fuel through those valves. The number of stop valves that open (main injector firing) increases with load. Overall fuel flow to the combustion chamber is supplied by valve 60 which is increased with increasing load. As noted with respect to Ng, there is neither any pulsing nor any reassignment of injectors to different groupings by Iwai.

In Iwai's secondary embodiment (Figure 8), there is again a constantly on fuel flow to an auxiliary flame injector. In addition, Iwai arranges his primary injectors in groups with three groups shown in the figure. These groups of injectors are turned on or off (not pulsed) in response to load conditions and to maintain desired fuel/air ratios. The groups of injectors are hard wired/plumbed so that any particular injector belongs to only one group and the grouping of injectors can not be changed under the control of the electronic control unit.

It is clear that Iwai does not teach: 1) the pulsing of injectors; 2) the use of groups of injectors with phase differences in their pulsing; or 3) a system where the electronic controller can reassign injectors to different groups to meet changing conditions.

For all the above reasons, Applicant respectfully submits that Iwai does not anticipate Applicant's invention, and Applicant requests the Examiner to withdraw the 35 U.S.C. 102(b) rejection.

Applicant submits that he has addressed and overcome all of the Examiner's objections and rejections, and respectfully requests that the Examiner pass the application to issue.

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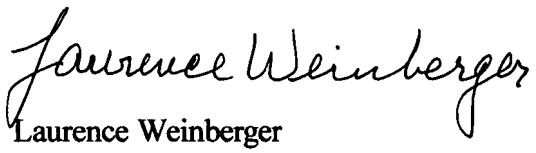
Respectfully submitted,



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